

What is claimed is:

1. A turbo-compressor, comprising:

an inlet guide vane enabling to change a vane angle thereof;

a blow-off valve;

5 a suction condition detecting means for detecting at least one of temperature and suction pressure of a working gas sucked into said turbo-compressor; and

a controlling means having a database relating to a minimum angle of said inlet guide vane with respect to the suction condition.

10 2. A turbo-compressor, comprising:

an inlet guide vane enabling to change a vane angle thereof;

a main body of a turbo-compressor;

a discharge pressure detecting means for detecting discharge pressure of said turbo-compressor;

15 a check valve being positioned at a side of said turbo-compressor main body than said discharge pressure detecting means;

a blow-off valve for blowing off a gas compressed within said turbo-compressor;

20 a suction condition detecting means being positioned in an upstream side of said inlet guide vane, for detecting at least one of temperature and suction pressure of a working gas sucked into said turbo-compressor; and

a regulator for controlling an angle of said inlet guide
25 vane and opening/closing of said blow-off valve, and further comprising,

a surging detecting means being provided between said check valve and said turbo-compressor main body, and

a database being provided within said regulator, for describing therein a relationship between a suction condition and
5 a minimum inlet guide vane angle with respect to a target pressure, respectively.

3. The turbo-compressor, as described in the claim 2, wherein said regulating means renews data of the minimum inlet guide vane angle within said database when said surging detecting means
10 detects a surging.

4. The turbo-compressor, as described in the claim 2 or 3, further comprising a higher controller for controlling said regulating means.

5. An operation method of a turbo-compressor, for
15 controlling discharge pressure of said turbo-compressor with using an inlet guide vane and a blow-off valve, comprising the following steps of:

detecting a value through a temperature detecting means or a pressure detecting means;

20 obtaining a minimum inlet guide vane angle at that detection value by referring to data of the minimum inlet guide vane angle, which are memorized in a regulator equipped with said compressor, upon basis of said detection value; and

driving said inlet guide vane at that minimum angle or greater
25 than that through a vane driver.

6. The operation method of a turbo-compressor, as described in the claim 5, wherein said data of the inlet guide vane angle is renewed while opening the inlet guide vane by a predetermined amount when a surging generates within said turbo-compressor.

30 7. The operation method of a turbo-compressor, as described

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in the claim 5, wherein a characteristic of the discharge pressure of the compressor to the suction flow rate is memorized into the regulator, and when the inlet guide vane angle which is obtained from said characteristic upon changing of said suction flow amount
5 comes down to be smaller than the minimum inlet guide vane angle, the inlet guide vane is set at the minimum inlet guide vane angle while opening the blow-off valve.

8. The operation method of a turbo-compressor, as described in the claim 5, wherein a deviation of a vane angle is obtained
10 when the discharge pressure is higher than a target discharge pressure, and when the vane angle added with the deviation comes down to be equal or less than the minimum inlet guide vane angle, the inlet guide vane is set at the minimum inlet guide vane angle while opening the blow-off valve.

15 9. The operation method of a turbo-compressor, as described in the claim 5, wherein the compressor is shifted into a non-load operation condition by fully opening the inlet guide vane when the discharge pressure is higher than a target discharge pressure and the blow-off valve, and when this condition continues for a
20 predetermined time period, then the compressor is stopped on the operation thereof.